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POPULAR ERRORS IN LIVING AND THEIR INFLUENCE OVER THE PUBLIC HEALTH.

BY CHARLES W. PURDY, M. D.

It seems altogether probable, if indeed not already assured, that the next and greatest advance in medical science will be the mastery of the art of preventing disease. In fact, the trend of medical thought and energy has been surely in the direction of this object for a number of years. It is true that the amount of disease which an educated physician is able successfully to cope with to-day, when armed with our modern resources and methods, seems very great, if compared with that which was possible to the medical man in the days of our fathers; yet this appears to be dwarfed almost into insignificance beside the measure of pain and life it seems possible to save by means of preventive measures.

A subject that so intimately concerns the welfare of the public at large; that is so deeply important in its bearings upon the state, society, business, and domestic life; and withal a study so eminently altruistic in its nature, cannot but command our attention and most careful consideration.

In order to attain the greatest success in the preservation of health, the prevention of disease, and the prolongation of life, something more is necessary than the discovery of disease germs, and of effectual measures for their destruction. It is necessary for the public to understand more thoroughly that health, like financial capital, must be earned if possessed; that, though sometimes a legacy, it remains with the possessor as a reserve only when guarded with the same care as is a bank account; that overdrafts, beyond legitimate living or running expenses, will surely impair the principal; and that, if these be continued, the health must inevitably become bankrupt sooner or later, in direct proportion to the amount of reserve capital, and the number and extent of the overdrafts made upon it. It seems high time, then, that more widespread and efficient measures be adopted for the purpose of educating the general public in those physiological laws, the observance of which most surely conserve the bodily health, erect the strongest barriers against the encroachments of disease, and thus conduce to the attainment of long life. It seems well nigh a reproach to modern civilization that the higher the plane of intelligence, education, and social attainments reached by most peoples, the greater the public tendency to live unphysiological lives, and history unerringly tells us that to this source we may invariably look for the first evidences of physical decadence. The ancient Greek, through his sacred regard for and scrupulous observation of physiological laws, comparatively imperfect as his understanding of them was, succeeded in building up a physical type of manhood that has ever since challenged the admiration of the world. It was not, indeed, until dominated by the more wealthy and aggressive Roman, that, in the assimilation of his seductive luxuries and excesses of life, his splendid physical attainment began to become undermined. The same alluring influences that beguiled the mind of the philosophic Greek into forgetfulness of his lofty physical ideals have ever operated more or less markedly upon all subsequent nations, and that, as a rule, in proportion to their acquirement of wealth and social elevation, nor is our own fair land and more practical people without danger from this very source.

The problem, then, presented for our consideration finds its solution in the answer to the simple question, How shall we best live ? In briefly reviewing some of the more prominent factors that go to make up the reply to this question, it may be premised that this discussion is intended to apply more especially to the life and habits of our own American people. The writer holds that if a man who is born of healthy parents, and who is himself healthy at birth, become seriously disabled in health before the age of from 65 to 70, barring accidents or infectious disease, it is solely because he has not lived properly.

Beginning with the subject of food, it may be emphatically stated that the greatest dietary sin of the average American is his meat-eating propensity. He devours this brawn-producing food upon all occasions, and upon all the calendar days of the year, even ecclesiastical days not excepted. Indeed, it would seem that the less occasion he has to call upon his muscular resources—or, in other words, the more sedentary his habits—the more he reinforces his muscular system by his habitual consumption of animal food. It is not uncommon, especially among the well-to-do of our population, to see butchers' meat served with every meal, either as the chief or as the adjunct course. Now the amount of butchers' meat that a man of ample appetite will consume when thus regularly spread before him on practically all occasions represents to his excretory organs a tax in its disposal that is physiologically prodigious.

Man belongs essentially to the class of omnivora, and therefore his physical mechanism has been so adjusted that his health is best promoted by drawing upon all the ordinary products of the earth for his food supply. His love of variety may safely lead him to gratify his palate from practically all sources comprising the gift of nature to the animal kingdom, but assuredly he may not confine himself very largely to any one of these sources without reaping the certain penalty of impaired health, or even of premature death; and to no article in the whole list of food supply does this apply with more force than to flesh foods. In order to make clear the physiology of this fact, attention may first be called to the axiom that the disorders of the human mechanism which occur after adult or middle life are largely those that are due to the inability of the organism to rid itself of waste materials; in other words, these diseases are but expressions of the loss of balance between excretion and ingestion. As contributing to this loss of balance, the waste or by-products of flesh foods are among the largest and most common factors, as will be immediately explained. Cooked meat, as ordinarily served upon the table, represents the very high range of nitrogenous composition of 27 per cent. The lean portion holds the great bulk of the nitrogenous contents of the meat; elements which the system is enabled to utilize only in relatively small amounts, chiefly for the purpose of renewing waste of muscular tissue (3 to 5 ounces of meat per day); while the great bulk of those elements that maintain the various operations of the economy, as represented by heat and force, must be supplied by the hydrogen and carbon groups of foods (twenty to thirty ounces per day). The excessive use of highly nitrogenized foods, of which butchers' meat is the type, therefore leads to an accumulation of nitrogenous waste products in the blood, which, unless they be to the fullest extent metamorphosed and oxidized by active exercise, act injuriously upon the organism, damaging the organs and functions which maintain life. Among the pernicious effects of an accumulation of nitrogenous waste products in the blood is the premature hardening of the arteries, entailing all those dangers from arterial hemorrhage of which apoplexy is the type, and in addition early impairing nutrition, so that the meat-eater grows old before his time. Indeed, it is well known that excessive meat-eating ages man more quickly than any other excess except alcoholism. The ill effects of the excessive use of animal food upon the circulatory system are by no means confined, however, to the arteries. A large proportion of those who are intemperate in this way are subject to progressive enlargement of the heart, and, since this inevitably leads to degeneration of the cardiac muscle, such people are exceedingly prone to sudden death from so-called "heart-failure," or collapse of that organ. The extra tax imposed upon certain glandular and excretory organs in elaborating and eliminating the waste products consequent upon a large consumption of meat foods results in such enormous functional overwork that these organs not infrequently begin to fail about middle life, and soon after fifty years of age they often break down completely. Thus by far the largest number of cases of primary Bright's disease (interstitial neptisitis) are directly caused by this practice. We have amongst us a certain type or class of people, which is certainly very large numerically, and which may be designated briefly by the following characteristics: They are typically healthy or even robust in appearance, inclined to rather full habit of body, but are sedentary in their habits, taking but little exercise; they possess ample appetites, which, as a rule, they gratify without stint and largely upon butcher-meat. Now, as a matter of careful observation, of the large and increasing number of cases of acquired Bright's disease among us, we may safely estimate 90 per cent. of the cases as belonging to this class. Again, the excessive use of animal foods, especially when coupled with sedentary habits of life, solves the greater part of such problems as the frequency among our people of such diseases as rheumatism and gout, in which respects we bid fair to outstrip our so-called "beef-eating" cousins on the opposite side of the Atlantic.

It should not be supposed that animal foods are best avoided altogether, but it is of the greatest possible importance that the supply be as nearly limited to the requirements of the system as possible, and it should especially be remembered that these requirements are much smaller in people of sedentary life than in those of active habits. In some respects the excessive use of animal food is more harmful than excessive use of vegetable foods, because the system is able to appropriate only a limited quantity of the former. The human organism possesses no resources for storing away excess of nitrogenous elements, and, therefore, the waste, or by-products of animal food, must be disposed of by complicated processes, through delicately constructed mechanisms. With vegetable foods it is somewhat different, since the excess may be stored up for future use, chiefly in the form of fat, while the waste, or by-products thereof, for the most part, find exit through the comparatively more direct and less complicated mechanism of the intestinal canal. Habits of exclusive vegetarianism, however, are not advised, though a moderate approach to such a standard has much to recommend it, as tending to promote health and long life. This fact was strongly brought out by Sir George Humphry, who carefully investigated the life histories of centenarians in England. His report was published by the Collective Investigation Committee of the British Medical Association in 1887. Of the thirty-seven people who had lived over one hundred years, the following features appear in the report: three took no animal food, four took very little, twenty a small amount, ten a moderate amount, and only one habitually took much meat.

Next in order of the more serious dietary errors common among our people is the excessive use of sweets and starchy foods. Those foods whose chief contents consist of starch and sugar form a group chemically known as carbo-hydrates, and their chief use in the economy of the body is the production of heat and force. They occupy precisely the same relationship to the human mechanism that coal does to the steam engine; indeed, by the same process in both are heat and force evolved—viz., by the oxidation or combustion of carbon. Owing to its more perfect, though more complicated, mechanism, the human apparatus is enabled to extract from the fuel one part of force to five parts of heat; while the most perfect steam engine yet constructed has only been able to extract from its fuel about one part of force to eight parts of heat. The human mechanism possesses another economic advantage over the steam engine in the utilization of its fuel; within certain limits the excess of fuel employed (starches and sugars) is converted into fat and stored up in the organism for future use. While, however, possessing such high economic advantages over the steam engine in the utilization of its fuel, the human mechanism possesses one serious drawback. It is more complex and intricate in construction, and in its operations it is more liable to get out of order, especially when an excess of fuel (food) is employed while the apparatus is running at low pressure. Herein precisely lies the error entailed by the habits of a large proportion of our well-to-do people with regard to the use of carbo-hydrate foods (starches and sugars). They live at high pressure in the amount of heat and force producing agents consumed, while in the utilization of heat and force, in their sedentary habits, they live at very low pressure.

Once introduced into the stomach, amylaceous and saccharine foods (starches and sugars) must pass through one of two processes; either (*a.*) they must undergo the first step in the normal process of digestion and then pass on to the liver for further transformation, or (*b.*) they must undergo destructive fermentation, with resulting liberation of large quantities of gas, which entails all those discomforts and symptoms known as flatulent dyspepsia. It seems perfectly reasonable, then, that if the human mechanism have submitted to it more carbo-hydrates than it can dispose of within a limited time, waste with the above-described consequences is more than likely to ensue. In other words, and to follow our former metaphor still further, the overstoking of the human engine with fuel chokes the firebox, the fuel becomes wasted, and the whole mechanism becomes clogged and disabled for efficient action. Such is the inevitable consequence of overloading all naturally weak stomachs with carbo-hydrate foods, and the practical physician well knows that one of the best remedies for this evil is to substitute green vegetables for sweet and starchy ones, because the former will not ferment into gases even if they be not digested.

In some cases, the stomach possesses more than the average digestive power, and under such circumstances a relatively large amount of sweets and starches may pass the stomach in assimilable form. In such cases the extra tax falls upon the liver, because one of the chief functions of that organ is to elaborate the glycogen (transformed starch) into fat. Habitual overtaxation of the liver leads to functional impairment of that organ, and if continued it is likely to result in time in organic disease. The conditions so commonly characterized as "bilious attacks," i. e., headaches, furred tongue, and transient nervous storms, accompanied by decided depression of spirits, are due to the escape of bile derivatives into the circulation. With long-continued recurrences of these manifestations, the skin assumes a more or less sallow hue, indicative of chronic bile poisoning. Many of these subjects acquire in time organic changes in the liver. A few of them develop gall stones, which entail acute and not unfrequently fatal suffering; while a very considerable proportion of them run on into diabetes—a disease that has increased in frequency in the United States one hundred and fifty per cent. within the last forty years.

It is not to be understood that all excessive consumers of amylaceous and saccharine foods pay the penalties just described. The stomach and liver in many cases will withstand the extra work imposed upon them without impairment or breakdown, and, when they do so, we are enabled to trace the metamorphosis of starches and sugars to their ultimate normal form in the organism, that is, fat. The decided tendency of our well-to-do people to become unduly stout as they arrive at middle age furnishes a striking example of this chemico-physiological transformation of starches and sugars, as will be clearly evidenced by a glance at the habitual diet list of this class of people. While it is by no means denied that other factors in a measure contribute to the production of obesity, yet that condition is, in the main, due to the generous use of carbo-hydrate foods. Now, with all the traditional and actual amplitude of good nature that accompanies amplitude of body, it cannot be truthfully asserted that corpulence or obesity is a good thing, so far as the efficiency or durability of the physical mechanism is concerned. It may be laid down as a general proposition that fat people are comparatively short lived. Marked accumulations of fat in the human organism impede normal processes of oxidation, and moreover they tend to produce atrophy of the muscular system, and ultimately they favor degenerative changes in certain vital organs, notably so in the heart. Moreover, it cannot be successfully maintained that the stout man possesses more strength and endurance than the man of moderate weight, although, paradoxical as it may seem, the former has stored up within him much larger amounts of potential force (fat). The truth is, the fat man has utilized too much of his working space for the storage of his fuel and therefore his machinery is crowded and restricted in its natural operation. While, therefore, his movements are ponderous, they lack the poise and precision which make those of the man of moderate weight more effective. In addition to this, the fat man encounters a similar disadvantage to that from which our modern Atlantic liners suffer—too much of his energy and force is expended in carrying his increased avordupois ; his machinery is, therefore, constantly subjected to abnormal strain when in motion, and consequently it is liable to premature wearing out or complete breakdown.

Another error to be noted, and one which there is reason to fear is scarcely less common among our people and certainly not less serious in its consequences, consists in the excessive quantity of food consumed. To the lay mind nothing seems to augur so strongly in favor of robust health as a hearty appetite. Furthermore, there would seem to be a strong conviction in the public mind, sanctified by tradition from time almost immemorial, that the more a man eats the better he is. The quantity of food that many people *naturally* eat is very large as compared with their actual physiological requirements; add to this the many tempting forms in which food is presented to the palate by our modern culinary arts, the sharpening of the appetite by the ante-prandial cocktail, the stimulus afforded the appetite by a bottle of good wine, and the result is often the consumption of an amount of food that simply overwhelms the assimilative organs. Such indulgence, if unrestricted and habitual, taxes both the assimilative and the excretory organs to their highest capacity, especially when coupled with sedentary life, and moreover it lends an additional impetus to the evils springing from the use of improper quality of food, which have already been considered. The human elaborating and excretory mechanism was evidently adjusted for ordinary wear and tear to an average limited period of about seventy years. Under 40 per cent. of extra work we must naturally expect impairment or breakdown of the mechanism much earlier. It should, therefore, excite no special surprise that so large a proportion of our well-to-do people die from Bright's disease, heart failure, and allied diseases at fifty or fifty-five, who should, and under properly regulated lives and habits would, have attained the natural ages of seventy or over. Paradoxical though it may seem, such people usually spring from exceptionally healthy stock, and often point with pride to the fact that their immediate ancestors lived to advanced ages of eighty years or more. This paradox, however, is more apparent than real, for investigation will usually reveal the fact that, for the most part, the parents in such cases were people of more simple habits, such as corresponded with New England life seventy-five or a hundred years ago. The truth is that the well-to-do man of to-day lives in a faster age than that of his father and grandfather; he meets with greater opportunities and possibilities, and therefore greater stimulus to all his energies; he more easily acquires pecuniary resources, and in larger amounts, and therefore he possesses greater luxuries of domestic life. With these come greater temptations to excess. While he has often inherited a splendid constitution from his ancestors, unlike them he has run his physical mechanism at a breakdown rate, and it must of necessity more quickly wear out.

Before quitting the subject of food, it may prove profitable to consider briefly some of our popular beverages. As a rule, Americans consume too much sugar in their beverages. Thousands of drug-stores reap their most handsome profits during the summer season in dispensing the most atrocious compounds under the name of "soda water." These preparations are saturated with cheap sugar, are often made up of poor water flavored with various extracts and aromatics, and are entirely destitute of the article from which the name is derived—soda. Recently it has become the custom to add the various forms of ice-creams to these compounds, and to present the whole mixed problem to a physiologically astonished stomach and liver through the seductive agency of so-called silver spoons. At the dinner-table champagne is perhaps the favorite alcoholic indulged in by those who can afford it; and the average quart bottle of champagne contains about one-eighth of a pound of sugar. Those of more moderate means content themselves with sauterne or sherry, which contains rather less than half as much sugar as champagne, while many still more economically inclined patronize domestic wines, some of which average about half a pound of sugar to each quart bottle.

At our open-air resorts so largely patronized by the populace in summer the aristocrat may indulge in his favorite champagne, or he may follow the example of the man of more plebeian palate and purse and gratify his thirst with beer, which contains an average of six grains of sugar to each ounce. It will be readily seen that habitual use of any of the beverages named entails the consumption of large amounts of sugar; so that it becomes a matter of comparative indifference from which of these sources a man derives his headache or indigestion; for, be it remembered, that, as a rule, it is the sugar, and not the alcohol, that is responsible for both.

In the consideration of general habits, nothing seems more strikingly characteristic of the American than his indomitable love of physical repose. It is by no means intended, even inferentially, to accuse him of indolence, which it would be clearly unjust to do, but he is, *par excellence,* the man of sedentary life. Gifted with ingenuity and mechanical handicraft scarcely approached by the man of any other nation, he has turned these gifts somewhat largely to account in providing substitutes for his legs. The rapid development of the various systems of transit in the United States within a comparatively few years has rendered the covering of distances so convenient, speedy, comfortable, and withal so cheap, that walking has almost gone out of fashion with us. In addition to this, the systematic development of the various departments of service, the high state of efficiency of the post, telegraphic, and telephone systems, have tended to diminish more and more the necessity of getting about, and to confine the man of business to his office; for, as a matter of fact, many men now conduct all the ramifications of extensive business enterprises without leaving the office desk. Nor is it alone in business relations that Americans are emphatically sedentary. In recreations and amusements the same tendency has largely prevailed. Relaxation and amusement are sought at the theatre perhaps more largely and uniformly by our people than by any other. If a man, however, really determines that he needs fresh air to improve his health, it is the fashion to go for a carriage ride, and thus he generously gives to his horse that which he himself most needs—a little wholesome exercise. At the present time it is seriously believed by some observers that our people are on the eve of a muscular revolution, and the widespread use of the bicycle lends color to this belief. There can be no doubt that a continuance so general of this delightful and wholesome practice must ultimately result in substantial benefit to the public health. If practised with ordinary intelligence and discretion, bicycling furnishes an ideal type of exercise, which would decidedly tend to counteract the pernicious effects of our sedentary habits, and this applies emphatically to our women as well as to our men.

As standing in close relationship to our sedentary tendencies it may be noted that, in our northern latitudes, our dwellings, stores, and offices are almost constantly overheated during the colder months. When living and sleeping in an atmosphere, the temperature of which is but a few degrees below that of blood heat, but little call is made upon the heat and force producing agents taken in as food. Besides, an overheated atmosphere invites the blood to the surface of the body, thereby largely maintaining an artificial circulation in the capillaries (small vessels). This impairs the tone and vigor of the heart's action, because that organ is thus relieved of a very considerable portion of its work. When the artificial heat is withdrawn and the body comes into contact with the cool air, the blood recedes from the surface, and so remains for the most part, because the heart has lost its power to force the blood into the peripheral vessels at the surface. Our people, therefore, cultivate a diminished resistance to the influence of cold in those very latitudes where the vicissitudes of climate demand that they should foster increased resisting circulatory power. It should not, therefore, seem a matter of surprise that in our northern latitudes common colds and catarrhal diseases prevail so largely, nor yet that in the winter months the mortality lists become alarmingly swelled through such fatal diseases as acute rheumatism and pneumonia.

Before concluding this review it seems altogether proper that reference should be made to the important subject of clothing. While Americans expend, perhaps, more money upon apparel than any other nation, yet they are physiologically the worst clad of all civilized nations. The physical objects of clothing are to protect the body against cold or against warmth, as the climate may require, and all other hygienic uses ultimately resolve themselves into one or the other of these objects. Now, as regards protection against cold, it is a matter of comparative indifference of what material external garments are composed so long as the proper quality of goods be worn next the skin. Herein lies the error committed by a large proportion of our people. It is the exception to find with us persons who are habitually clad in *all-wool* undergarments, and yet in our northern latitudes such clothing only can afford adequate protection against the climate. In order to maintain equable warmth of the body, the first essential condition to be secured is uniform dryness of skin. We should, therefore, in selecting undergarments in cold latitudes, choose a material that possesses the highest possible hygroscopic (water-absorbing) power. Now, wool is emphatically that material, possessing, as compared with cotton and linen, double their hygroscopic power as regards weight, and quadruple their hygroscopic power for surface. Of the five textiles most employed for clothing—jute, linen, cotton, silk, and wool—the last is the weakest conductor of heat and therefore the warmest, while the others follow in reverse order. Moreover, wool takes up and holds the moisture from the body, and this moisture contains much escaped latent heat which the body always loses rapidly under perspiration. In holding this moisture the wool radiates it but slowly, and in so doing renders back to the body its escaping latent heat. It will therefore be readily perceived that in our northern latitudes all-wool undergarments should be worn, *and none other*. The weight of these garments is a matter of comparative insignificance and may be left to individual preference, since with a light-weight but all-wool garment in contact with the skin one may readily keep the body warm by adding outside wraps as the day or climate may demand.

With regard to protection against heat, fortunately in the United States, there is less to contend with in this direction than in tropical latitudes, although a high mortality among children is due to excessive heat in the summer months in the larger cities. In the selection of clothing to protect the body against heat—*i. e.*, the direct solar rays—color is the chief feature to be considered, since texture has but little influence. White affords the best protection, next light-gray, then yellow, pink, blue and black in the order named. In warm latitudes in hot seasons, then, white or light-gray clothing should be worn, and appropriate weight should also be considered.

In summing up the answer to the question propounded at the beginning of this enquiry, it will be noted that the answer depends somewhat upon individual constitutions, habits, occupations, and location in each individual case. But the following suggestions will serve as a general guide. The man of robust constitution and sedentary habits should live largely upon fish, green vegetables, and acid fruits, eating butchers' meat but once daily. He may in addition eat bread and potatoes, but these should constitute his limit of starchy foods. Cakes, farina, oatmeal, and the various cereal breakfast foods should be indulged in but rarely or altogether avoided. Sugar should be used but sparingly, and only as a flavoring for food or beverages, and never as a food in itself. If he use wine with his dinner, it should preferably consist of the non-saccharine order ; and he should limit the quantity of fluids consumed with his meals to from twelve to sixteen ounces. He should dine between six and seven o'clock in the evening, and at all times eat in moderation, never under any circumstances overloading his stomach. In northern latitudes, and especially in humid and changeable climates, such as those near the seaboard and the great chain of inland lakes, he should wear all-wool undergarments, including stockings, the year round. In dryer and somewhat warmer climates, such as the Middle and Southern interior States, silk underwear may be substituted for wool. Warm or tepid baths are preferable to cold ones, and after middle age cold showers, and plunges, or even sea bathing, are not without serious risks.

The man of sedentary life should reduce the temperature of his office and dwelling to 68 degrees, Fahr., and he should habitually walk at least two miles in the open air each day or take an equivalent amount of physical exercise. The best form of exercise is horseback riding, next in order is bicycling, while walking may be ranked as third.

The laboring man may be permitted more liberties in his diet than the man of sedentary habits, especially in the matter of butchers' meat, starches, and sugars. His greater muscular activity more readily oxidizes the waste products of these foods, and, moreover, his increased force expenditure demands more heat and force producing foods. The laboring man may therefore safely and with benefit eat butchers' meat twice daily, and he may also eat oatmeal and puddings at least two or three days in the week in addition to his bread and potatoes. He should dine in the middle of the day, and he should be allowed a full hour for his dinner and rest. His dinner is best for him if served without any form of alcohol. In matters of clothing, the laboring man should follow the general lines already laid down.

Through childhood and adolescence proportionately more meat should be used than after the period of adult growth, because meat furnishes the basis of tissue growth, which is active at such periods. A larger proportion of starches and sugars are also demanded during these periods in order to sustain the incessant activity of early life. With regard to the clothing of children, all the rules laid down apply here with emphatic force.

In the light of the facts and conclusions established in this discussion, is it not pertinent to this subject, considering the momentous nature of the issues involved, that in conclusion we should pause and ask ourselves the following questions ?

(1.) Are we not becoming more and more addicted to the use of drugs for the relief of ills and pains that are purely the result of faulty habits of living, and most of which would be more surely, more effectively and permanently relieved by simply correcting our improper habits of life ?

(2.) Are we not afflicted with a large amount of suffering, misery, and disease for which there is no necessity whatever ; and are we not likely through hereditary transmission to entail much of this misery upon our offspring ?

(3.) Do not a very large number of our people die much earlier in life than their constitutions, apparent vigor, and family histories would seem to warrant; and are not these premature deaths very largely unnecessary, and therefore clearly avoidable?

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